EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Brian J. Cash, Reg. No. 60,546 on September 8, 2010.

The application has been amended as follows:

Please Amend Claims as follows:

1. (Examiner Amended) A management method of network devices, comprising the

following steps of:

(A) composing, by a plurality of network devices, a cluster through the

following steps:

(1) designating, by a processor, a device in a network as a cluster

management device and configuring the device correspondingly by a network

management device;, wherein the cluster management device comprises: an address

translation module adapted to perform network address translation for management

messages of member devices, a Dynamic Host Configuration Protocol (DHCP)-like

module adapted to accomplish allocation of private IP addresses to member network

devices, and a topological information processing module adapted to acquire
information of topological architecture of a network;

   (2) initiating a topology acquisition process to acquire information of
topological architecture of the network within a specified number of hops in the network
by the cluster management device;

   (3) designating candidate devices to be added to the cluster in the
topological architecture according to the information of topological architecture acquired
from the cluster management device, and informing the cluster management device to
start the cluster member device addition process by the network management device;

   (4) adding the designated candidate devices to the cluster and configures
the candidate devices correspondingly by the cluster management device, so as to
make the candidate devices become member devices of the cluster;

   (5) after the cluster is established, managing the member devices in the
cluster by the cluster management device, and forwarding management messages
which are from outside of the cluster and destined to the member devices through a
standard Network Address Translation (NAT) process of the address translation
module, to corresponding member devices to process~~,~~; and processing the
management messages according to a normal processing process by the member
devices;

   ~~wherein,~~ the process of adding candidate network devices to the cluster ~~in
step (4)~~ comprises:

(A1) sending cluster addition requests to candidate network devices that can be added to the cluster by the cluster management device;

(A2) determining whether it can be added to the cluster or not according to its own condition by each candidate device; if the candidate device can not be added to the cluster, feeding back a reject response and terminating the cluster addition process; otherwise feeding back an accept response to the cluster management device;

(A3) after receiving the response from the candidate device and if the candidate device agrees to be added to the cluster, sending a configuration message containing private IP address, member number, handshaking interval, and state retention time, etc. to said candidate device by the cluster management device;

after receiving the message, configuring the candidate device correspondingly, and sending a complete response to the cluster management device after the configuration;

(B) establishing IP data channels via the cluster management device between the network devices in the cluster and the network management device by the cluster management device, the cluster management device configuring the network devices with a data structure comprising following fields:

network type: designed to identify the type of network where the device is; and

physical address: designed to identify the physical address of the device in the network, wherein at least one of the network devices in the cluster is designated as the cluster management device and configured with a public IP address;

the network devices in the cluster are configured and updated with private

IP addresses and routes by the cluster management device; and

(C) managing the network devices in the cluster through said IP data

channels via the cluster management device by said network management device.

12. (Examiner Amended) The method according to claim [[7]] 1, wherein ~~the~~ necessary

configuration for each member device added to the cluster in step (4) includes

configuring each member device with the following items: member device number,

private IP address of member device, name of member device, state of member device,

operating state of member device, and cluster management password.

14. (Examiner Amended) ~~A cluster management apparatus for network devices~~

~~comprising: a cluster device manager and a member device connected with the cluster~~

~~device manager, wherein:~~

~~the cluster device manager comprises:~~

~~an address translation module, adapted to perform network address~~

~~translation for management messages of member devices;~~

~~a Dynamic Host Configuration Protocol (DHCP)-like module, adapted to~~

~~accomplish allocation of private IP addresses to member network devices;~~

~~a first cluster member management module, which is connected with the~~

~~address translation module A11, the DHCP-like module A12 and a topological information~~

~~processing module A14 individually, and adapted to manage member network devices~~

~~in a concentrate manner, and to forward management messages, which are from~~

~~outside of the cluster and destined to member devices, to respective member devices to~~

~~process, so that the member devices can process the management messages~~

~~according to normal processing process;~~

~~a first topological information processing module, adapted to detect the~~

~~topological architecture of network and to acquire the information of topological~~

~~architecture of network within a specified number of hops in the network;~~

~~the member device comprises:~~

~~a second cluster member management module, adapted to accomplish~~

~~cluster management at the member device end;~~

~~a second topological information processing module, adapted to~~

~~accomplish detection of adjacent devices and response/forwarding of topology~~

~~acquisition requests, the cluster device manager configuring the member devices with a~~

~~data structure comprising the following fields:~~

~~network type: designed to identify the type of network where the member~~

~~device~~

~~is; and~~

~~physical address: designed to identify the physical address of the member~~

~~device in the network;~~

~~wherein, the topological information processing module acquires~~

~~information of topological architecture of network within a specified number of hops in~~

~~the network through the topological information processing module at a candidate~~

~~device side, and sends the information to the cluster member management module;~~

~~the cluster member management module sends a cluster addition request
to the cluster member management module in a candidate device that can be added to
the cluster;~~

~~the cluster member management module determines whether to be added
to the cluster according to its conditions, and feeds back an accept or a reject response
to the cluster member management module;~~

~~when the cluster member management module receives an accept
message from the candidate device, the DHCP-like module performs allocation of a
private IP address of member network device and sends the private IP address,
together with configuration information including member number, handshaking interval,
and state retention time etc, to the cluster member management module in the
candidate device via the cluster member management module;~~

~~the cluster member management module uses the information to
configure the candidate device accordingly, and feeds back a complete response to the
cluster management device after configuration operation.~~

A cluster management apparatus for network devices comprising:

a cluster device manager and a cluster member device connected with the
cluster device manager;

the cluster device manager comprises:

a processor and a memory;

an address translation module, adapted to perform network address
translation for management messages of cluster member devices;

a Dynamic Host Configuration Protocol (DHCP)-like module, adapted to accomplish allocation of private IP addresses to member network devices;

a first cluster member management module, which is connected with the address translation module, the DHCP-like module, and a first topological information processing module individually, and adapted to manage member network devices in a concentrate manner, and to forward management messages, which are from outside of the cluster and destined to cluster member devices through a standard Network Address Translation (NAT) process of the address translation module, to respective cluster member devices to process, so that the cluster member devices can process the management messages according to a normal processing process;

the first topological information processing module, adapted to detect the topological architecture of a network and to acquire the information of topological architecture of the network within a specified number of hops in the network;

the cluster device manager configuring the cluster member devices with a data structure comprising the following fields:

network type: designed to identify the type of network where the cluster member device is; and

physical address: designed to identify the physical address of the cluster member device in the network;

the cluster member device comprises:

a second cluster member management module, adapted to accomplish cluster management at the cluster member device;

a second topological information processing module;

wherein, the first topological information processing module acquires information of topological architecture of the network within a specified number of hops in the network through a topological information processing module at a candidate device, and sends the information to the first cluster member management module;

the first cluster member management module sends a cluster addition request to a cluster member management module at the candidate device that can be added to the cluster;

the cluster member management module at the candidate device determines whether the candidate device can be added to the cluster according to its conditions, and feeds back an accept or a reject response to the first cluster member management module;

when the first cluster member management module receives an accept message from the candidate device, the DHCP-like module performs allocation of a private IP address of member network device and sends the private IP address, together with configuration information including member number, handshaking interval, and state retention time, to the second cluster member management module;

the cluster member management module at the candidate device uses the information to configure the candidate device correspondingly, and sends back a complete response to the cluster management device after the configuration operation.

15. (Examiner Amended) The method according to claim 1, wherein the step (2) is performed to acquire information of managed devices to be added into the ~~management~~

cluster, the information including MAC address and interconnection port number of each managed device.

16. (Examiner Amended) The cluster management apparatus according to claim 14, wherein the address translation module processes in standard network address translation the management messages, which are from outside of the cluster and destined to the cluster member device after the candidate device becomes a member device of the cluster and the management messages are forwarded to the second cluster member management module of the a respective member device via the first cluster member management module.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ESTHER BENOIT whose telephone number is (571)270-3807. The examiner can normally be reached on Monday through Friday between 7:30 a.m and 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Asad M. Nawaz can be reached on 571-272-3988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

E.B
September 8, 2010

/Asad M Nawaz/

Supervisory Patent Examiner, Art Unit 2442